

REMARKS

A. Overview

Prior to this Amendment, the present application includes claims 12-18, 20-37 and 39-67. With this Amendment, Applicants have amended claims 12, 36, 55, 56 and 67. As such, claims 12-18, 20-37 and 39-67 are still pending in this application.

B. Allowable Subject Matter

Applicants acknowledge with appreciation that the Examiner has found claims 44, 45, 49 and 50 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants have rewritten claims 44 and 49 to be in independent form including all of the limitations of the base claim and any intervening claims.

C. Claim Objections

Referring to numbered paragraph 1 of the Office Action, claim 56 was objected to by the Examiner for not being understandable or grammatically correct. With this Amendment, Applicants have amended claim 56 to be understandable and grammatically correct. Accordingly, Applicants respectfully request that the Examiner remove the objection to claim 56.

Referring to numbered paragraph 2 of the Office Action, claim 67 was objected to by the Examiner because it ended abruptly as in the middle of a phrase. With this Amendment, Applicants have amended claim 67 to end appropriately. Accordingly, Applicants respectfully request that the Examiner remove the objection to claim 67.

D. 35 U.S.C. §102 Rejection: Drahm I

Referring to numbered paragraph 3 of the Office Action, claims 20, 22-26, 28, 30-34 and 55-58 are rejected under 35 U.S.C. §102(b) as being anticipated by Drahm, U.S. Patent No. 5,531,126 ("Drahm I").

Drahm I deals with the measurement of viscosity in relation to Figure 8 (col. 8, lines 52-67). This section of Drahm I states (emphasis added):

The arrangement according to the invention can also be used to determine the viscosity of the fluid. This is done with the circuit of FIG. 8. The signal from one of the sensing elements 18, 18' or 19, 19' and a signal provided by the driver circuit and representative of the vibration amplitude of the

dummy tube 14, 14', e.g., the above-mentioned signal from the electromagnetic system 30, are peak-value-rectified by means of diodes 51 and 52 with associated capacitors 53 and 54, respectively. The output signal of the diode 51 is divided by the output signal of the diode 52 by means of an analog divider 55. The output signal of the divider 55 is converted to the viscosity signal V by means of a microcontroller 56. To this end, the microcontroller 56 may contain a look-up table which contains a previously stored assignment between the output-signal values of the divider 55 and the viscosity V.

In contrast to Drahm I, independent claims 20 recites:

... meter electronics... with an evaluating circuit which derives from said at least one sensor signal and from the excitation current a viscosity value representative of the viscosity of the fluid.

Drahm I does not disclose, teach or suggest an excitation arrangement that derives a viscosity value from “the excitation current” as recited in claim 20. Drahm I teaches that the viscosity value is derived from “a signal provided by the driver circuit and representative of the vibration amplitude of the dummy tube” (col. 8, ll. 56-67). There is no disclosure or suggestion in Drahm I to derive the viscosity value from an excitation current. For at least these reasons, Applicants respectfully submit that claim 20 is patentably distinguishable over Drahm I. Claims 22-26, 55 and 56 depend from claim 20. Accordingly, Applicants respectfully request that the Examiner find claims 20, 22-26, 55 and 56 allowable.

Independent claim 28 recites:

... a transducer assembly . . . with a sensor arrangement including an electro-dynamic sensor, responsive to oscillations of the flow tube, for generating at least one sensor signal, representative of a velocity of lateral deflections of the flow tube; and
meter electronics... wherein the evaluating circuit determines the viscosity value depending on said motion being estimated and said excitation current.

Drahm I does not disclose, teach or suggest a sensor arrangement “including an electro-dynamic sensor . . . for generating at least one sensor signal, representative of a velocity of lateral deflections of the flow tube” as recited in claim 28. In addition, as discussed with regard to claim 20, Drahm I does not disclose, teach or suggest determining a viscosity value from an excitation current as recited in claim 28. For at least these reasons, Applicants respectfully submit that

claim 28 is patentably distinguishable over Drahm I. Claims 30-34, 57 and 58 depend from claim 28. Accordingly, Applicants respectfully request that the Examiner find claims 28, 30-34, 57 and 58 allowable.

E. 35 U.S.C. §103 Rejection: Drahm I in view of Drahm II

Referring to numbered paragraph 4 of the Office Action, claims 12, 14-18, 27, 35, 59 and 61-67 are rejected under 35 U.S.C. §103(a) as being unpatentable over Drahm I in view of European Patent No. EP 849,568 A1 to Drahm. Applicants bring to Examiner's attention that the disclosure of European Patent No. EP 849,568 A1 corresponds to U.S. Patent No. 6,006,609 ("Drahm II").

Claim 27 depends from independent claim 20, which Applicants submit is patentable as discussed above. Claim 35 depends from claim 28, which Applicants submit is patentable as discussed above.

Drahm I discloses a lateral mode meter using a dummy tube, while Drahm II discloses a single tube torsion mode flow meter. Drahm I discusses the disadvantages of torsion mode flow meters and at col. 1, line 56 – col. 2, line 47. There is no suggestion to combine these two references to produce the claimed invention. Therefore, Applicants respectfully submit that such combination uses hindsight and is therefore improper.

Independent claim 12 recites:

a transducer assembly . . . with an electromechanical excitation arrangement . . . driving said flow tube to oscillate in a bending mode and in a torsional mode simultaneously with said bending mode oscillations for producing viscous friction within the fluid, and
with a sensor arrangement including an electro-dynamic sensor, responsive to oscillations of the flow tube, for generating at least one sensor signal, representative of oscillations of the flow tube . . .

Neither Drahm I nor Drahm II disclose a transducer assembly acting of a flow tube to drive a bending mode and a torsional mode simultaneously together with a sensor arrangement including an electro-dynamic sensor as recited in claim 12. For at least these reasons, Applicants respectfully submit that claim 12 is patentable over Drahm I and Drahm II. Claims 14-18 depend from claim 12. Accordingly, Applicants respectfully request that the Examiner find claims 12 and 14-18 allowable.

For at least the reasons as discussed with regard to claim 12 Applicants respectfully submit that claim 59 is patentably distinguishable over Drahm I in combination with Drahm II. Claims 61-67 depend from claim 59. Accordingly, Applicants respectfully request that the Examiner find claims 59 and 61-67 allowable.

F. 35 U.S.C. §103 Rejection: Drahm I in view of Van Cleve

Referring to numbered paragraph 5 of the Office Action, claims 21, 29, 36, 37, 39-43, 46-48 and 51-54 are rejected under 35 U.S.C. §103(a) as being obvious over Drahm I in view of U.S. Patent No. 5,661,232 to Van Cleve ("Van Cleve").

Claim 21 depends from independent claim 20, which Applicants submit is patentable as discussed above. Claim 29 depends from independent claim 28, which Applicants submit is patentable as discussed above.

Van Cleve discloses a complete measuring system which derives from two Coriolis flow meters a density value and a viscosity value. There is no suggestion to combine this dual flow meter measuring system with the dummy tube measuring system disclosed in Drahm I to produce the claimed invention. Therefore, Applicants respectfully submit that such combination uses hindsight and is therefore improper.

Claim 36 has been amended to recite "said flow tube being clamped to an inlet and an outlet end so as to be capable of vibrating and said excitation arrangement acting on said flow tube approximately midway between said inlet end and said outlet end." Claims 37, 39-43, 46-48 and 51-54 depend from claim 36.

For at least these reasons, Applicants respectfully request that the Examiner find claims 36, 37, 39-43, 46-48 and 51-54 patentable.

G. 35 U.S.C. §103 Rejection: Drahm I in view of Van Cleve

Referring to numbered paragraph 6 of the Office Action, claims 13 and 60 are rejected under 35 U.S.C. §103(a) as being unpatentable over Drahm I in view of Drahm II and further in view of Van Cleve.

Claim 13 recites using "said density value for determining the viscosity value" and claim 12 from which it depends recites using "the excitation current" for determining a viscosity value. Thus, claim 13 requires use of both the density value and the excitation current in determining the viscosity value. Similar to claim 13, claim 60 which is dependent on claim 59 requires use of

both the density value and the excitation current in determining the viscosity value. Neither Drahm I, Drahm II or Van Cleve disclose the measurement of viscosity based on the excitation current and the measured density of the fluid as recited in claims 13 and 60. For at least these reasons, Applicants respectfully submit that claims 13 and 60 are patentably distinguishable over Drahm I, Drahm II and Van Cleve. Accordingly, Applicants respectfully request that the Examiner find claims 13 and 60 allowable.

H. Final Remarks

Applicants submit that claims 12-18, 20-37 and 39-67 are believed to be in condition for allowance. Such allowance is respectfully requested.

If necessary, please consider this a Petition for Extension of Time to affect a timely response. Please charge any additional fees or credits to the account of Bose McKinney & Evans LLP, Deposit Account No. 02-3223. In the event that there are any questions related to these amendments or to the application in general, the undersigned would appreciate the opportunity to address those questions directly in a telephone interview to expedite the prosecution of this application for all concerned.

Respectfully submitted,

BOSE McKINNEY & EVANS LLP

A handwritten signature in black ink, appearing to read "Anthony P. Filomena", written over a horizontal line.

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